

Early identification of alcohol problems

John B. Saunders, MD, FRACP; Katherine M. Conigrave, MB, BS

A high proportion of patients seen in clinical practice have an underlying alcohol problem. This is often difficult to detect, but failure to make the diagnosis may result in unnecessary investigations and inappropriate treatment. Furthermore, there is now good evidence of the effectiveness of brief intervention for problem drinking when it is still at an early stage. Several questionnaires and procedures based on clinical examination findings and laboratory tests are available to help in early diagnosis. They can be incorporated into the standard medical assessment and form the basis for screening programs for health risk factors.

Over the past decade there has been a substantial shift from the view that alcohol-related problems are experienced only by chronic alcoholic patients. There is a realization that a much broader spectrum of people suffer harm because of their use of alcohol and that these problems are far more heterogeneous than was once thought. Alcohol intake has been identified as a risk factor for various disorders in the same way that cigarette smoking and hypertension have been identified as risk factors for coronary heart disease and cerebrovascular disease. These two developments underpin the need for medical involvement in the prevention and management of alcohol-related problems.

Before describing the various techniques for early identification, it is appropriate to expand on the rationale for this approach and document why physicians have an important role and why appropriate training should be incorporated into medical curricula.

Alcohol-related problems

Surveys of patients admitted to general hospitals and psychiatric hospitals have shown that as many as 30% of patients, and sometimes more, have some form of drinking problem. Fewer than one-third are physically dependent alcoholic patients; the remainder would be considered alcohol abusers or as having a "hazardous" level of consumption. Findings are similar in hospitals in Australia,¹ the United Kingdom^{2,3} and the United States.⁴ The manifestations of problem drinking are protean and include common medical disorders, such as hypertension, palpitations, gastroesophageal reflux and diabetes, and psychosocial problems, such as marital disharmony, anxiety, personality change and employment diffi-

culties. It is not surprising that people who abuse alcohol make more use of health care services than the remainder of the population.⁵ Alcohol is a major factor in trauma of all kinds, including work-related and recreational injuries. In the hospital emergency department, particularly during the evening, alcohol-related problems are common. Holt and colleagues⁶ found that 40% of patients had consumed alcohol before attending the emergency department of a city hospital, and, on the basis of their blood alcohol levels, 32% were probably intoxicated.

Failure to diagnose

If the underlying drinking problem is not diagnosed, patients may be subjected to investigations, procedures and diagnostic operations that can be time consuming, costly and hazardous. In the past patients with acute alcohol-related hepatitis presenting with cholestatic jaundice were commonly subjected to diagnostic laparotomy, often with fatal results. A history of alcohol consumption had not been taken, and the diagnosis was therefore not considered. This is perhaps an extreme example; when a drinking problem has led to damage as severe as this, it is usually not difficult to detect. There are many instances in which early recognition of the drinking problem would expedite the diagnostic process.⁷ Table 1 sets out some common misdiagnoses made in relation to alcohol abuse (O.G. Aasland: unpublished data, 1985).

Misdiagnosis

There are numerous examples of misdiagnosis resulting in inappropriate treatment. Treatment of recurrent dysphoria of alcohol dependence with

From the Centre for Drug and Alcohol Studies, Royal Prince Alfred Hospital, Sydney, and the departments of Medicine and Psychiatry, University of Sydney, New South Wales, Australia

Correspondence to: Professor John B. Saunders, Centre for Drug and Alcohol Studies, Royal Prince Alfred Hospital, Missenden Road, Camperdown 2050 NSW, Australia

tricyclic antidepressants is common. However, this is ineffective because it ignores the true cause of the dysphoria, and hazardous, given the well-known interaction between this class of drugs and alcohol. Medication for alcohol-related hypertension is less effective and less safe than reduction in alcohol intake.⁸ If the patient with alcohol-related trauma has the wound repaired and is discharged, the primary problem has not been addressed. This happens all too often in the pressured situation of the emergency department.

The local physician

Surveys commissioned by the Australian Department of Health (unpublished data, 1988) showed that 48% of respondents named their general practitioner as the person from whom they were most likely to seek help. Patients believe that general practitioners should enquire about their alcohol intake and other health risk factors,⁹ yet in a survey of British general practitioners only 29% of the general practitioners regularly advised patients to reduce alcohol consumption.¹⁰ The general practitioner is in contact with a large proportion of the community in any 1 year and so is in an ideal position to detect cases at an early stage and offer simple intervention. Problem drinkers make more use of health care services than does the remainder of the population and are more likely to be in contact with their physician.⁵

Early intervention

There is increasing evidence that identifying people with early-stage problem drinking and then providing brief counselling is effective in persuading a substantial proportion of them to reduce their intake to low-risk levels — for nondependent drinkers the target would be no more than three or four

drinks containing 10 g of alcohol, three or four times a week for men, or two to three drinks two to three times a week for women¹¹ — or to abstain.¹²⁻¹⁶ In the pioneering study from Malmo heavy drinking men were identified in a screening program and were given brief counselling by a physician and feedback on their laboratory results.¹² Over the 6- to 8-year follow-up period there was a significant reduction in sickness-related absenteeism, hospitalization and mortality compared with the control group. Kristenson and associates¹² emphasized the need for assessment and treatment of heavy drinkers within medical practice. The results of the controlled trials of early intervention provide the clearest rationale for increasing the capacity of medical practitioners to diagnose problem drinking accurately and at an early stage. This view is encapsulated in the report of a World Health Organization (WHO) expert committee: "There is an urgent need for the exploration of methods of detecting persons with harmful alcohol consumption before health and social consequences become serious and irreversible, and disability established, and to develop intervention strategies that can be applied to primary contact settings."¹⁷

The shift from treatment of established disease to a secondary prevention approach has parallels in many areas of medicine. One of the major developments in health care in the second half of the 20th century has been the attempted modification of cardiovascular disease risk factors. Indeed, the Malmo early intervention study arose from a medical intervention program originally established for coronary heart disease prevention.¹²

Clues to the diagnosis

The primary vehicle for diagnosing a drinking problem is systematic history taking and clinical examination. At present, this appears to be a counsel of perfection. Barrison and coworkers¹⁸ reported that

Table 1: Frequent misdiagnoses made in problem drinkers*

Symptoms and signs	Misdiagnosis
Abnormal skin vascularization	Solar damage
Jaundice	Cholelithiasis, viral hepatitis
Dyspepsia	Peptic ulcer
Morning nausea and vomiting	"Viral infection"
Recurrent abdominal pain	Cholelithiasis, pancreatitis
Polyuria	Diabetes
Gynecomastia	Breast tumour, primary endocrine disorder
Palpitations	Ischemic heart disease
Hypertension	Essential hypertension
Insomnia, nightmares	
Poor concentration	Anxiety state
Hand tremor	

*Adapted from O.G. Aasland: unpublished data, 1985.

in only one-third of medical records of patients admitted to a London teaching hospital was there any quantification of alcohol intake. In another study only 28% of patients who reported an alcohol problem in a self-administered questionnaire had been noted as having a drinking problem by their family physician.¹⁹ In a patient who exhibits denial of a drinking problem or whose difficulties are restricted to one aspect of daily life — marital discord, for example — the diagnosis requires considerable clinical acumen and a healthy index of suspicion. It is easier to make a diagnosis in the advanced case, the patient in alcohol withdrawal or with established cirrhosis or neuropsychiatric sequelae.

In recognition of the shortfall in detection, particularly of the early-stage problem drinker, investigators have developed checklists, questionnaires, clinical examination procedures and laboratory tests as diagnostic aids.

One of the first attempts to develop such a checklist was made by an English general practitioner who devised an "alcohol at-risk register" that was used for the provisional allocation of patients attending health centres to a high-risk category for alcohol problems.²⁰ Patients receiving a high-risk classification were investigated through a "spare-time activities questionnaire" (STAQ), whose focus on alcohol was disguised by the inclusion of questions on other aspects of health and lifestyle.²⁰ The STAQ has been found acceptable to patients, but when a modified

version of this procedure was used in a community study, fewer than half the known alcoholic people and problem drinkers were identified.²¹ Other types of checklists have been produced (Table 2).^{11,22-25}

Questionnaires

The longest running method for systematically detecting problem drinkers within defined populations is the questionnaire. The prototype questionnaire is the Michigan Alcoholism Screening Test (MAST), which was introduced in the early 1970s.²⁶ The 25 questions were selected because of their ability to distinguish between alcoholic inpatients and patients admitted to psychiatric hospitals who had no drinking problem. The MAST and its progeny have a direct and undisguised focus on alcohol and require subjects to be aware of their alcohol problem and to be cooperative. The MAST has been used widely and has proven successful in detecting alcoholic patients in the clinical setting. Modifications of the original questionnaire include the brief MAST,²⁷ the Self-Administered Alcoholism Screening Test²⁸ and the Malmö MAST (Mm-MAST).²⁹ The Munich Alcoholism Test (MALT)³⁰ incorporates self-report questions from the MAST with a section to be completed by the clinician. Many of the questions in the MAST and its variants focus on symptoms of advanced alcohol abuse — the patient has experienced delirium tremens, for instance, or has attended Alcoholics Anonymous meetings or

Table 2: Early indicators of problem drinking^{11,22-25}

Episodes of intoxication twice a month or more
Drinking during most leisure activities
Heavy drinkers among most friends
Light or skipped meals while drinking
Difficulty in stopping drinking once started
Limited success with attempts to cut down on drinking
Amnesic episodes while intoxicated ("blackouts")
Insomnia and nightmares
Accidents in which alcohol is involved
Charges of "driving under the influence"
Frequent use of alcohol to relieve stress and anxiety
Recurrent depression
Impotence
Lateness or absence from work
Frequent sick days
Financial problems
Family concerned about drinking
Family members with symptoms of neurosis
Dyspepsia
Morning nausea and vomiting
Loss of appetite
Recurrent diarrhea
Frequent presentations to emergency departments with nonspecific symptoms
Signs of old rib fractures on chest radiograph
Nonspecific abdominal pain
Facial flushing
Morning headache

been admitted to hospital because of drinking. In the community setting, where the prevalence of these advanced alcohol problems is lower, the sensitivity of these instruments in detecting problem drinking falls markedly, with fewer than half such subjects being identified.²¹

The CAGE was developed as a short screening test for alcoholism;³¹ the acronym is derived from four questions: "Need to cut down on drinking? Annoyed by criticism about your drinking? Guilty about drinking? Need a morning drink or eye-opener?" A score of two or more indicates probable alcoholism. The test performs well in identifying alcoholic patients in a clinical setting.³² However, in a community study the CAGE detected no more than half the known alcoholic people and problem drinkers.²¹ It is more commonly used as an adjunct to the clinical interview than as the sole means of detection.

Other screening instruments include the Canterbury Alcoholism Screening Test (CAST)³³ and the MacAndrew Scale.³⁴ The CAST is a 23-item questionnaire on dependence and psychosocial complications. It is undisguised and has found wide acceptance, particularly in hospital practice. The MacAndrew Scale is derived from the Minnesota Multiphasic Personality Inventory and is aimed at detecting behavioural abnormalities associated with alcohol abuse. However, these behaviour patterns, such as poor impulse control, are not specific to alcohol abuse and can occur in drug addiction and thrill seeking. Some questionnaires have been adapted for computer presentation — the Reich Interview³⁵ is one example of a computer-based screening procedure. A sophisticated innovation is the computerized Lifestyle Assessment Procedure.³⁶

One recently devised instrument is the Alcohol Use Disorders Identification Test (AUDIT),³⁷⁻³⁹ which is designed to identify people with harmful or hazardous alcohol consumption levels well before physical dependence or chronic physical or psychosocial damage. This questionnaire arose from the WHO collaborative study on identification of people with harmful alcohol consumption. The investigators were charged with developing a simple screening instrument that would be applicable to primary health care settings and have cross-national validity. In each of the six participating countries subjects were recruited from settings considered typical of primary care facilities in that country. Each subject underwent a structured interview covering medical history, current physical and psychologic symptoms, the quantity and frequency of alcohol consumption, drinking behaviour, including putative symptoms of dependence, alcohol-related physical and psychosocial problems, and self-perception of an alcohol problem.

AUDIT questions were selected on the basis of their ability to distinguish people who had hazardous alcohol consumption or related problems from those who did not. Known alcoholic people were excluded from the sample; in this respect AUDIT differs from other questionnaires, which are generally constructed from the responses of subjects with established alcoholism.

Three areas were chosen for representation in AUDIT: quantity and frequency of alcohol consumption, symptoms of early and more established dependence, and alcohol-related problems. It comprises 10 questions (Table 3), and the responses are scored from 0 to 4, the range for the whole questionnaire therefore being from 0 to 40. A score of 8 or more indicates the likelihood of hazardous or harmful alcohol consumption and identifies that person as requiring further assessment. Questions on medical history and current physical and psychologic symptoms did not correlate well enough with known alcohol-related problems to justify their inclusion in AUDIT. On the basis of its ability to detect in the original sample people with hazardous or harmful alcohol consumption, AUDIT has a sensitivity of 92% and a specificity of 94%.

AUDIT can be used alone as an undisguised questionnaire or incorporated into a broader health risk factor screening instrument. What is its relevance to everyday clinical practice? We would not expect every medical student and physician to administer the questionnaire to all patients, but the questions provide a good framework for taking an alcohol history and can be included in the standard clinical history. It is also reasonable to expect medical faculties to teach their students to ask these questions.

Responses to questions on potentially threatening topics improve if the interviewer takes a factual, nonjudgemental approach. Skills in posing these questions should be considered a priority in medical curricula. AUDIT has been published by WHO, and a manual is now available that outlines pertinent guidelines for its use.³⁸

A distinction must be made between questionnaires designed for case finding and those for the clinical assessment of patients with known drinking problems to determine their suitability for treatment programs — the Addiction Severity Index⁴⁰ is an example of the latter. Several questionnaires are designed to measure the severity of alcohol dependence along a continuous scale — the Severity of Alcohol Dependence Questionnaire,⁴¹ the Edinburgh Alcohol Dependence Schedule,⁴² the Alcohol Dependence Scale⁴³ and the dependence scale of Raistrick and colleagues.⁴⁴ Although these methods have been used by some investigators as screening instruments, their true role is quite different.

Clinical examination findings

Many subtle abnormalities can be found with clinical examination of the problem drinker (Table 4). Some reflect the tissue toxicity of alcohol, some the effects of trauma and others the signs of alcohol withdrawal. They are distinct from the classic signs of alcohol-induced disease, such as spider nevi, known to generations of medical students. The use of clinical examination for case detection originated with Le Go,⁴⁵ a French physician who grouped the signs into the "Le Go grid", which has been used extensively in screening for alcoholism in France.

More recently, Skinner and associates⁴⁶ have compared the value of clinical examination, medical history and laboratory tests in the detection of problem drinkers attending an outpatient service. Clinical signs distinguished this group from light

drinkers more accurately than either medical history taking or laboratory tests. From this work Skinner's group constructed the Alcohol Clinical Index.⁴⁶ The clinical signs include several from the Le Go grid together with tandem gait, deep knee bend, edema of the soft palate, bruises, abrasions and trauma-related scars and cigarette burns. The authors advise incorporating this index into the standard clinical examination.

The value of clinical examination was also investigated in the WHO collaborative study.³⁷ Although significant correlations were found between the presence and severity of these signs and other measures of alcohol-related problems, the association was not strong ($r = 0.2$ to 0.4), and there was inconsistency between centres. There seemed to be a threshold effect, with a relation being apparent only above alcohol intakes of 80 g per day. With the

Table 3: AUDIT—Alcohol Use Disorders Identification Test³⁷⁻³⁹

<i>(Please circle the answer that is correct for you)</i>				
1. How often do you have a drink containing alcohol?	never	monthly or less	two to four times a month	two to three times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9
3. How often do you have six or more drinks on one occasion?	never	less than monthly	monthly	weekly
4. How often during the last year have you found that you were not able to stop drinking once you had started?	never	less than monthly	monthly	weekly
5. How often during the last year have you failed to do what was normally expected from you because of drinking?	never	less than monthly	monthly	weekly
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	never	less than monthly	monthly	weekly
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	never	less than monthly	monthly	weekly
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	never	less than monthly	monthly	weekly
9. Have you or someone else been injured as a result of your drinking?	no	yes, but not in the last year	yes, during the last year	
10. Has a relative or friend or a doctor or other health worker been concerned about your drinking or suggested you cut down?	no	yes, but not in the last year	yes, during the last year	

exception of scars and bruises, such physical signs reflect prolonged and generally unremitting daily drinking and a more advanced degree of alcohol-related harm than one would infer from the term "early identification". The five most discriminatory items were abnormal skin vascularization, conjunctival injection, hand tremor, tongue tremor and soft hepatomegaly, and these form the basis of the WHO clinical screening procedure.

The value of such findings is more to alert the clinician to the need to enquire about alcohol consumption and related problems than as a formal screening procedure. They also provide objective evidence of harm when denial of a drinking problem is evident.

Laboratory tests

When the subject of early identification of problem drinking is raised, many physicians immediately think of blood tests, but there are three reasons why they should not place too much reliance on such tests. The first is philosophic; we contend that physicians should make diagnoses by talking to their patients, not by relying on a blood test. Second, conventional biologic markers are insensitive to early-stage problem drinking. They are of less value than questionnaires or physical examination^{37,46} and are more useful in combination with self-report and clinical data. Third, most tests have to be performed in biochemistry or hematology laboratories rather than in physicians' offices; this entails a delay in feedback of results to patients. If blood tests are relied upon for diagnosis of a drinking problem, the patient may be lost to follow up before the results are at hand.

The best of the conventional markers of alcohol consumption are serum γ -glutamyl transpeptidase

(GGT) levels and mean erythrocyte cell volume (MCV). Both were identified in the early 1970s and were initially reported as being abnormal in 60% to 80% of heavy drinkers.^{47,48} The original samples consisted largely of patients who were admitted with alcohol-related physical sequelae. In samples from the general community^{49,50} or from family practice or psychiatry units⁵¹ the sensitivity is only 10% to 40%, and measurements of GGT and MCV are less satisfactorily than the results of questionnaires.

The GGT level is unlikely to be elevated in younger patients with drinking problems of shorter duration and is affected by various commonly used medications and by several disease states. Although the MCV tends to increase with high alcohol consumption, the difference between the mean level in a normal population and an alcoholic population is only about 5 fl.

Other biochemical parameters of alcohol intake include serum transaminase, alkaline phosphatase and uric acid levels. However, the abnormalities are too nonspecific to be of practical use in screening and serve mainly to raise awareness. The changes in high-density lipoprotein-C with excessive alcohol intake have only limited clinical usefulness. Apolipoprotein A-II levels correlate better with alcohol intake,⁵² but further study of their clinical usefulness is required.

Assays of blood and breath alcohol concentrations have a limited, though important, role. When positive, they provide objective evidence of recent drinking; this may be valuable information in patients with acute abdominal pain, confusional states or trauma. The blood alcohol level can also indicate the development of tolerance to alcohol. If a patient with a high blood alcohol level is coherent and not visibly intoxicated, one may conclude that there is tolerance to the effects of alcohol by dint of sus-

Table 4: Physical signs of problem drinking

Abnormal skin vascularization (especially facial telangiectasia)*
Conjunctival injection*
Coating of the tongue*
Tremor of mouth*
Tremor of the tongue*
Tremor of the hands*
Scars and bruises of varying age
Soft hepatomegaly
Bloated facies (may appear Cushingoid)
Parotid enlargement
Restlessness
Tachycardia
Hypertension
Hyperreflexia
Obesity
Feminization
Smelling of alcohol

*"Cardinal signs" of Le Go grid.⁴⁵

tained heavy drinking. However, many problem drinkers abstain for 24 hours before attending the physician's office, so there is a high prevalence of false-negative results.

In the WHO collaborative study conventional laboratory tests proved rather disappointing. Once known alcoholic people were excluded from the analysis, the correlation of serum GGT levels with mean daily alcohol intake ranged from insignificant values of 0.01 to modest correlations of 0.36.³⁷ The value of this blood test detecting of new cases appeared limited. The correlation of MCV with alcohol intake was nonsignificant in most samples. Serum alanine and aspartate aminotransferase levels had significant correlations with alcohol intake in only half the countries studied. The sensitivity of these markers for harmful or hazardous alcohol consumption ranged from 10% to 30%.

In summary, standard laboratory tests are not sufficiently sensitive to be used as the primary basis of screening. An abnormal value should be a cue to enquire about alcohol intake, but a result within the normal range by no means excludes a drinking problem. Discriminant analyses have identified weighted combinations of markers that distinguish alcoholic patients from normal drinkers with a higher degree of reliability.^{53,54} The value of such computer-based functions in detecting the early problem drinker has yet to be determined.

Newer biologic markers

Several new markers of alcohol consumption offer promise for early identification: carbohydrate-deficient transferrin, acetaldehyde-protein adducts, alcohol congeners and the excretion of biogenic amine metabolites. There are also markers such as mitochondrial aspartate aminotransferase that help differentiate between alcohol-related liver disease and liver disease of another origin. Another category of new generation marker comprises genetic predisposition to alcohol dependence, such as platelet monoamine oxidase levels, serotonin uptake and aldehyde dehydrogenase isozymes. The role of these markers of susceptibility, or "trait" markers, in delineating a population at risk for alcohol problems with a view to screening has not yet been established. At present the indicators of recent alcohol intake, particularly carbohydrate-deficient transferrin, show the most promise.

In the presence of a high alcohol intake an abnormal transferrin level, with a reduced carbohydrate content, is formed by the liver.^{55,56} This appears to result from acetaldehyde inhibition of glycosyltransferase, the enzyme that catalyzes glycosylation of transferrin in the liver. Carbohydrate-deficient transferrin (CDT) has high specificity and

sensitivity (greater than 90%) in detecting alcoholism.⁵⁷ It has been claimed to detect consumption of as little as 20 g/d of alcohol, though a threshold of 60 g/d of alcohol over 5 to 10 days is necessary to elevate CDT levels above those of the general population. The transferrin, with a half life of 15 days,⁵⁸ becomes normal with abstinence from alcohol.

The specificity of this test is impressive; no drugs have been found to increase the CDT level, and the only causes of false-positive results recognized to date are primary biliary cirrhosis (20% of cases), rare genetic variants of transferrin and a rare genetic glycoprotein disease. Measurement of CDT levels shows great promise as a powerful, single marker of excessive alcohol intake. However, it is not yet commercially available, and optimal assay conditions and racial variations must still be determined.

Acetaldehyde is able to bind covalently, forming adducts, with a variety of tissue components including erythrocyte membranes, hemoglobin and albumin. The value of acetaldehyde adducts, and antibodies to them, in detecting excessive alcohol intake is currently being studied in a number of centres.⁵⁹ Antibodies to acetaldehyde-protein adducts appear in the serum of alcohol-dependent subjects, the highest titres occurring in patients with alcoholic hepatitis.^{60,61} Although there is a slight increase in levels in patients with cirrhosis, there is no elevation of titres in those with fatty liver or fibrosis.⁶² It is thought that the acetaldehyde-protein adducts are formed in the hepatocyte and released into the circulation when there is liver cell damage, as occurs in alcohol-related hepatitis and cirrhosis. An immune response is stimulated, and antibodies to the adducts are formed.

Congeners such as methanol are present in small amounts in all alcoholic beverages and tend to accumulate in people with sustained heavy alcohol intake.⁶³ This finding has been confirmed by Bonte and Sprung,⁶⁴ who have shown that problem drinkers tend to have a blood methanol level higher than 5 to 10 mg/L.

Another marker of recent alcohol excess is the pattern of excretion of metabolites of biogenic amines. Serotonin and its major metabolite 5-hydroxyindole acetic acid (5HIAA) are normally present in the urine in small amounts. Alcohol decreases the rate of formation of 5HIAA; hence, alcoholic patients have reduced urinary excretion of this compound. After a high alcohol intake the ratio of urinary 5-hydroxytryptophol (another serotonin metabolite) to 5HIAA rises; this elevation has been used as an indicator of relapse in abstinent alcoholic people.⁵⁸ This ratio is a more rapidly responsive marker than some blood tests.

Several promising markers of susceptibility to alcohol dependence are being examined. Many, such as platelet adenylate cyclase levels, platelet serotonin uptake and platelet monoamine oxidase levels, relate to aspects of neurotransmission or intracellular message transduction.⁶⁵ In many cases blood levels of these markers reflect differences in central neurotransmission.⁶⁶ Abnormal values occur in alcoholic patients,⁶⁵ and in some cases in their nondrinking relatives. The current challenge for researchers is to differentiate those changes brought about by alcohol from the pre-existing variations that make a person more susceptible to dependence.

Composite instruments

Because of the limitations of questionnaires, clinical examination and laboratory tests when used as the sole basis for case finding, attempts have been made to combine a number of their elements to achieve a higher diagnostic yield. Ryback and colleagues⁵³ increased the discriminatory capacity of several biochemical and hematologic tests by computing weighted combinations of variables in a discriminant analysis. In a Swedish study, the addition of GGT measurement increased the accuracy of Mm-MAST in classifying problem drinkers.²⁹ Questions on trauma have been combined with blood markers of alcohol abuse by Skinner and associates,⁶⁷ and offer a greater degree of precision than when used separately. The Alcohol Clinical Index, which combines clinical examination and medical history, is based on the same rationale.⁴⁶ Other scales, such as the MALT, have integrated biomedical and self-reported data.³⁰ However, composite tests are more time consuming, cumbersome and less easily incorporated into everyday clinical practice than, say, a 2-minute questionnaire. Nevertheless, when the information is being obtained anyway — as in initial consultation or in a health screening program, for example — the items of the composite instrument can be scored with a minimum of additional effort.

Early detection of withdrawal states

A vital component of drug and alcohol work in hospitals is the early detection of drug and alcohol withdrawal states and their accurate monitoring during treatment to prevent withdrawal from progressing to delirium, in which there is a grave risk to the life of the patient and often great difficulty in controlling the syndrome.

Between 2.5% and 5.0% of the adult population is dependent on alcohol to the extent that these people suffer physical withdrawal symptoms when they stop or reduce drinking.⁶⁸ The clinical syn-

drome of alcohol withdrawal consists of autonomic hyperactivity that is characterized by tremor, tachycardia, hypertension, tachypnea, nausea, anxiety and sleep disturbance. Possible complications are seizures and hallucinations, the latter usually occurring in conjunction with confusion. Uncomplicated withdrawal is generally self-limiting, but delirium tremens, which is characterized by confusion, disorientation, paranoid delusions, visual hallucinations and cardiovascular decompensation, has a 15% mortality rate if inadequately treated.^{25,69}

All inpatients at risk of withdrawal should be monitored regularly from the time of admission. When the patient is suffering from a coexisting illness as well as alcohol withdrawal, the diagnosis is more difficult but all the more important. The physician must diagnose the withdrawal syndrome as early as possible to ensure appropriate treatment and prevent possible complications. Several rating scales have been developed to standardize clinical observations to allow early and accurate detection of the syndrome, to indicate the need for medication and to monitor response to therapy. Most rating scales score individual elements of the withdrawal syndrome and indicate the minimum score at which complications are likely to occur and when sedation is likely to be required.

One study identified 30 variables with which to monitor alcohol withdrawal and recommended 11 for clinical use.⁷⁰ Kramp and coworkers⁷¹ devised a delirium tremens rating scale of nine items and used the scores to study progress of the withdrawal. A clinical institute withdrawal assessment was developed in 1981⁷² and was subsequently modified.⁷³ The researchers found that patients scoring higher than 15 on the 19-item scale were at significantly increased risk of severe alcohol withdrawal if left untreated.

A seven-item scale designed specifically for general hospitals has been devised at the Royal Prince Alfred Hospital in Sydney, Australia.²⁵ It includes those items that Gross and collaborators⁷⁰ found correlated most highly with the overall severity of the syndrome and is brief enough to be incorporated into standard 4-hourly nursing observations. The presence of sweating, tremor, anxiety, agitation, increased body temperature, hallucinations and disorientation is assessed and scored from 0 to 4; the range of scores for the complete scale is therefore 0 to 28. A score of 5 or more indicates the need for sedation and more frequent monitoring. The dose of sedative is determined in relation to the withdrawal score, as is the need for adjunctive antipsychotic therapy. The inherent simplicity of this scale facilitates its acceptance in the general hospital, where the resources and expertise to use more complex rating scales might not be readily available.

Conclusions

There are now many techniques to assist in case detection of the alcoholic person and the early-stage problem drinker and in early detection of withdrawal states. Questionnaires that ask specifically about alcohol consumption and related problems are the most sensitive techniques available, particularly if the questions are presented within the less threatening context of a broadly based enquiry into health risk factors. Clinical examination tends to reflect more advanced alcohol-related harm and a longer duration of problem drinking. Newer biologic markers show promise in identifying the early-stage problem drinker. Combinations of biochemical tests and the use of composite instruments may offer more precise detection but perhaps at the expense of convenience. More important than trying to devise more and more precise indicators of problem drinking, be they questionnaires, physical findings or laboratory tests, is the need for these procedures to be incorporated into regular medical practice. Their use must be based on good interviewing skills, an appreciation of the scope and limitations of laboratory tests, an understanding of the importance of identifying the alcohol problem and confidence in applying intervention techniques to help the problem drinker lessen the risk of alcohol-related harm.

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